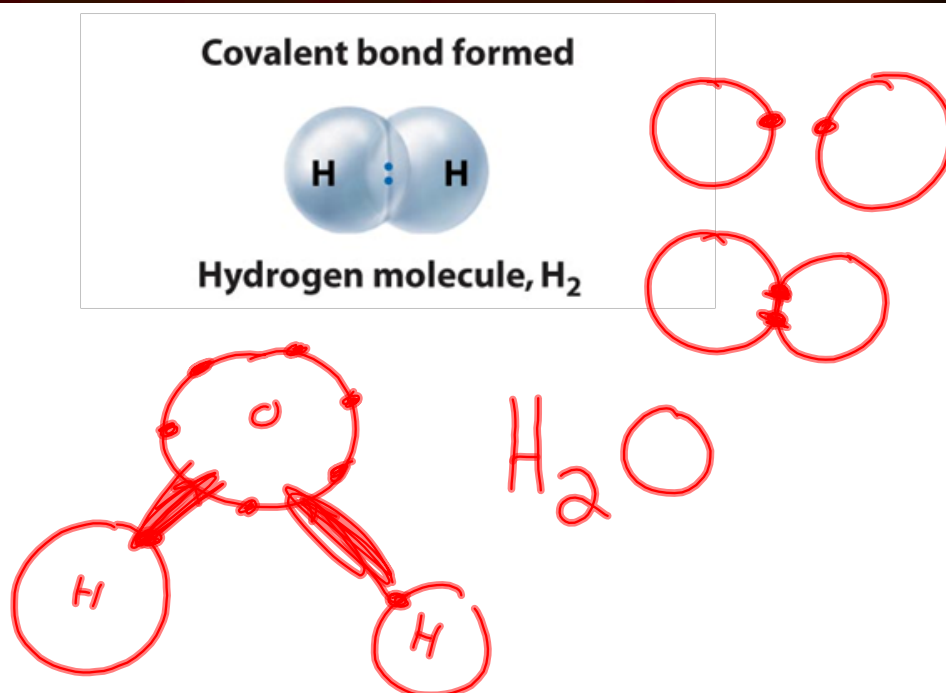


## Molecular Compounds

- Most compounds you encounter each day do not contain ions ---- ex. oxygen, sugar, carbon dioxide
- Ionic compounds involve the transfer of electrons from a metal to a non metal
- Molecular compounds involve the sharing of electrons between non metals
- The bonding that holds the shared electrons in place is called a **covalent bond**

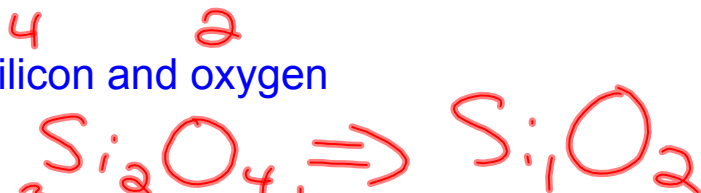


- Many non metals exist as covalently bonded molecules
- Hydrogen ( $H_2$ ), oxygen ( $O_2$ ), nitrogen ( $N_2$ ), fluorine ( $F_2$ ), bromine ( $Br_2$ ), and iodine ( $I_2$ ) all exist as diatomic molecules.....2 atoms sharing electrons
- The number of electrons a non metal is able to share is called its combining capacity

- For example carbon has 4 electrons in its outer shell, so it can gain 4 electrons by sharing with another non metal
- C and Si have a combining capacity of 4
- N, P and As have a combining capacity of 3
- O, S and Se have a combining capacity of 2
- H, F, Cl, Br, I have a combining capacity of 1
- The crisscross rule can be used once again to form formulas

State the chemical formulas:

a) silicon and oxygen



b) nitrogen and hydrogen



c) phosphorus and chlorine



d) sulfur and bromine



e) oxygen and fluorine



### Naming Molecular Compounds

- Some common names of molecular compounds are water ( $\text{H}_2\text{O}$ ), ammonia ( $\text{NH}_3$ ), hydrogen peroxide ( $\text{H}_2\text{O}_2$ ) and methane ( $\text{CH}_4$ )
- Other names contain prefixes based on the number of atoms involved
- Ex. Carbon monoxide    1     $\text{CO}$   
Carbon dioxide    2     $\text{CO}_2$   
Sulfur trioxide    3     $\text{SO}_3$   
Tetra would be used for 4  
Penta would be used for 5

Name the following:

- a)  $\text{CBr}_4$  - Carbon tetrabromide
- b)  $\text{NI}_3$  - Nitrogen triiodide
- c)  $\text{OF}_2$  - Oxygen difluoride
- d)  $\text{SiCl}_4$
- e)  $\text{N}_2\text{O}$
- f)  $\text{N}_2\text{H}_3$

Give the formula for the following:

1. diphosphorous pentoxide
2. nitrogen trioxide
3. dicarbon tetrachloride
4. sulfur pentoxide

### Molecular Compounds

1. How can you tell the difference between an ionic compound and a molecular compound?
2. What kinds of atoms form molecular compounds?
3. What type of bond holds atoms together in a molecular compound?
4. Name the following compounds (use prefixes)  
A)  $\text{CBr}_4$       B)  $\text{NI}_3$     C)  $\text{OF}_2$     D)  $\text{SiCl}_4$     E)  $\text{CO}$     F)  $\text{N}_2\text{O}_3$
5. Indicate whether the following is an ionic (i) or a molecular (m) compound? Name compound.  
A)  $\text{CO}_2$       B)  $\text{H}_2\text{O}$     C)  $\text{NaBr}$     D)  $\text{CaCl}_2$       E)  $\text{NO}$